CLAIMS

1. A lithium rechargeable battery comprising a positive electrode, a negative electrode and a non-aqueous electrolyte,

wherein said negative electrode comprises a copper core material and a negative electrode material mixture layer fixed on said core material,

said negative electrode material mixture layer includes an active material comprising a mixture of artificial graphite particles A and spherical graphite particles B,

said artificial graphite particles A are isotropic artificial graphite particles including graphite structure oriented at random and having:

(1) an interplanar spacing d_{002} between the (002) planes obtained by a powder X-ray diffraction method being not more than 3.362 Å;

(2) a ratio I_{002}/I_{110} of the peak intensity I_{002} attributed to the (002) plane to the peak intensity I_{110} attributed to the (110) plane, which are found from a diffraction pattern obtained by X-ray diffraction of said artificial graphite particles A molded into a pellet of 1.6 g/cm^3 in density, being not more than 1,000;

(3) a mean circularity of the particles being 0.85 to 0.95;

(4) a particle diameter D_{50} corresponding to a volume fraction of 50% measured by a laser diffraction particle size

distribution analyzer being 15 to 30 μm, and a ratio D_{10}/D_{90} of a particle diameter D_{10} corresponding to a volume fraction of 10% to a particle diameter D_{90} corresponding to a volume fraction of 90% being 0.2 to 0.5;

(5) a tap density after tapping of 900 times with a stroke length of 18 mm being not less than 1 g/cm^3; and

(6) a specific surface area measured by a BET method being not more than 1 m^2/g, and

said spherical graphite particles B having:

(1) a mean circularity of the particles being 0.88 to 1;

(2) a particle diameter D_{50} corresponding to a volume fraction of 50% measured by a laser diffraction particle size distribution analyzer being 5 to 15 μm;

(3) an interplanar spacing d_{002} between the (002) planes obtained by a powder X-ray diffraction method being not more than 3.357 Å; and

(4) a specific surface area measured by a BET method being not more than 8 m^2/g.

2. The lithium rechargeable battery in accordance with claim 1, wherein said artificial graphite particles A are obtained by kneading and granulating a base material of pulverized bulk mesophase pitch with pitch in a softened state and/or thermosetting resin, carbonizing the resulting granules at 700 to 1,500℃ and graphitizing the carbonized granules at 2,500 to 3,000℃.

3. The lithium rechargeable battery in accordance with claim 1, wherein the content of said spherical graphite particles B in said active material is 5 to 45 wt%.

4. The lithium rechargeable battery in accordance with claim 1, wherein said positive electrode and said negative electrode with a separator interposed therebetween are wound to form an electrode group, said electrode group being accommodated and sealed in a prismatic metal case or a case made of a laminate of an aluminum foil and a resin film.

5. The lithium rechargeable battery in accordance with claim 1, wherein said negative electrode material mixture layer further includes a rubber-like binder containing a butadiene unit and a cellulose-based thickener.

6. The lithium rechargeable battery in accordance with claim 1, wherein said spherical graphite particles B are natural graphite particles and/or natural graphite particles partially subjected to reforming treatment to make only their surfaces amorphous.

7. The lithium rechargeable battery in accordance with claim 5, wherein said rubber-like binder is added in an amount of not more than 3 parts by weight with respect to said active material of 100 parts by weight, and said negative electrode material mixture layer has a density of 1.6 to 1.8 g/cm^3 and a thickness of 40 to 100 μm.